$\omega = \frac{d\theta}{dt}$ Ang velocity

$\alpha = \frac{d\omega}{dt}$ angu accele.

$\alpha\, d\theta = \omega\, d\omega$

$ds = r\, d\theta$

$V = \omega r$ → velocity

$V = \omega r_p \sin\phi$

Acceleration

$a_t = \frac{dv}{dt}$ → tang

$a_{n_1} = \frac{v^2}{\rho}$ normal

→ $\boxed{a_t = \alpha r}$ $a_t = \alpha r_p \sin\phi$

→ $\boxed{a_n = \omega^2 r}$ $a_n = \omega^2 r_p \sin\phi$

grap $a = a_t + a_n$

$= \alpha r - \omega^2 r$

$dr_B = dr_A + dr_{B/A}$ → due to rot. about A

↓ due to trans. & rotation

due to trans. ← dist to trans. = about of A

$V_B = V_A + V_{B/A}$

$V_B = r_A + \omega \times r_{B/A}$

$\rho = \frac{m}{V}$ dm - dV.

$a_B = a_A + (a_{B/A})_t + (a_{B/A})_n$.

mm moment of inertia

$$I = \int_m r^2 dm$$

$$I = \int_m r^2 \rho \, dV.$$

$$I = mk^2 \quad \text{or} \quad k = \sqrt{\frac{I}{m}}$$

Planar equations

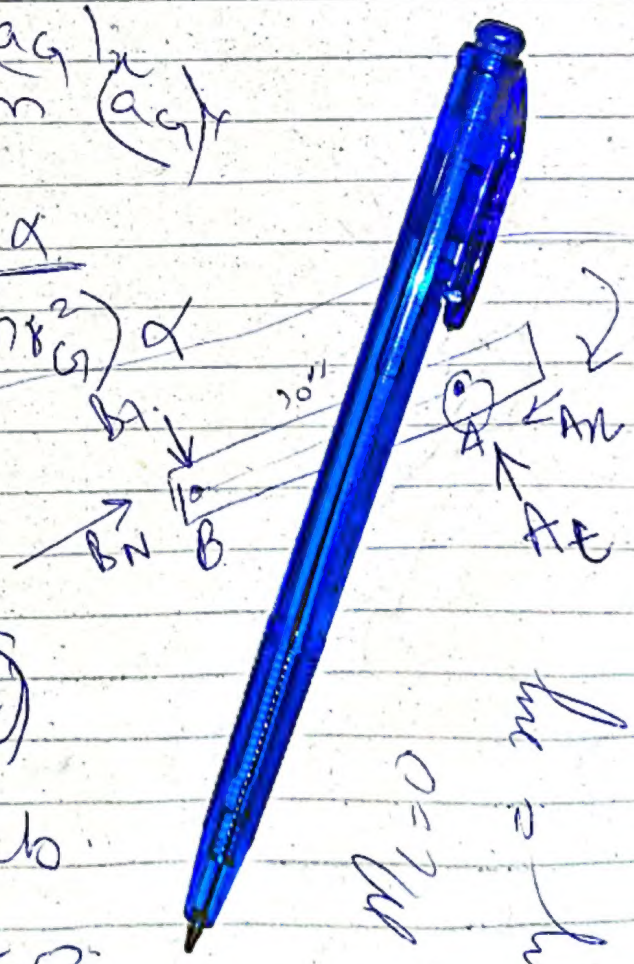
$$\Sigma F = m a_G$$

$$\Sigma F_x = m(a_G)_x$$

$$\Sigma F_y = m(a_G)_y$$

$$\Sigma M_G = I_G \alpha$$

$$\Sigma M_O = (I_G + m k_G^2)\alpha$$



$\Sigma M_A =$

$300(12)$

$B_t = 200$ lb.

$\Sigma F_{x=0}$

$B_t - A_t = 0$

$200 = A_t$